

REMARKS

Claims 1, 13, and 29 are amended herein and claim 39 is cancelled. Claims 11-12, 19-28, and 37-38 were previously cancelled. Claims 1-10, 13-18, and 29-36 are pending for the Examiner's review and consideration. The amendments to the claims are fully supported by the original specification and claims. No new matter has been added by the amendments made herein. Entry of the amendments at this time is therefore respectfully requested.

Claim Rejections

Claims 1-10, 13-20 and 29-36 were rejected under 35 USC § 112, first paragraph, as failing to comply with the written description requirement for the reasons set forth on pages 3-6 of the Office Action.

Applicant notes that claim 39 is a dependent claim that is directed specifically to a method of producing an angiospermous apomictic plant, wherein the step of selecting sexual plants from angiospermous plants is limited to selecting sexual plants from the group consisting of *Antennaria*, *Sorghum* and *Tripsacum*. Claim 39 was not rejected for lack of written description. The Office Action specifically affirms that the method is described with respect to *Antennaria*, *Sorghum* and *Tripsacum* -- see page 3 of the Office Action, "the specification only describes the method using the angiospermous plants of *Antennaria*, *Sorghum* and *Tripsacum*." In an effort to expedite the allowance of the present application, Applicant has cancelled claim 39 and has now amended the presently pending independent claims to include the elements of claim 39, *i.e.*, *Antennaria*, *Sorghum* and *Tripsacum*.

In view of the narrowing amendments made herein, Applicant's detailed disclosure and the working examples of *Antennaria*, *Sorghum* and *Tripsacum* using Applicant's claimed invention, one skilled in the art would reasonably conclude that the inventor had possession of the invention at the time of filing as set forth in the presently amended claims. Applicant therefore respectfully requests that this rejection be withdrawn.

Claims 1-10, 13-20, and 29-36 were also rejected under 35 USC § 112, first paragraph, as failing to comply with the enablement requirements for the reasons set forth on pages 6-10 of the Office Action. Applicant respectfully requests reconsideration.

As stated above, claim 39 is directed specifically to the step of selecting sexual plants from the group consisting of *Antennaria*, *Sorghum* and *Tripsacum*. Claim 39 was also not rejected for failing to comply with the enablement requirements. The Office Action, at page 4, appears to affirm this, stating that "the specification only provides evidence that the angiospermous plants of *Antennaria*, *Sorghum* and *Tripsacum* would work in the claimed invention (see page 28, lines 10-32 of the specification, for example)." In an effort to expedite the allowance of the present application, Applicant has cancelled claim 39 and amended the independent claims to include the elements of claim 39, *i.e.*, *Antennaria*, *Sorghum* and *Tripsacum*.

The application contains a thorough explanation of how the present duplicate-gene asynchrony approach to making apomictic plants is consistent with the observations that have been made in the apomixis field over many years and further explains why the theories and assumption of the prior art are deficient. Once it is understood by a person skilled in the art of plant breeding how apomixis arises, it is a routine matter to produce polyploids by chromosome doubling or B_{III} hybridization, for example, such that genetic segregation is suppressed

In view of Applicant's narrowing amendments only to *Antennaria*, *Sorghum* and *Tripsacum* and the working examples provided by Applicant, the great preponderance of the evidence weighs in favor of a finding of an enabling disclosure. For these reasons, it is respectfully requested that this rejection be withdrawn.

Claim 1 was rejected for nonstatutory obviousness-type double patenting in view of claims 1, 12, 14, and 16-17 of U.S. Patent No. 6,750,376. Applicant submits herewith a timely filed terminal disclaimer. Thus, this rejection is now moot and should be withdrawn.

Claims 1-10, 13-18, 29-36, and 39 were rejected under 35 USC §103(a) as being obvious over Bashaw (1980), in view of Savidan (1982), and further in view of Dujardin (1988) for the reasons set forth on pages 7-9. Applicant respectfully traverses.

Applicant's invention is directed to a unique method of first producing an angiospermous apomictic plant from selected sexual plants from *Antennaria*, *Sorghum* and *Tripsacum* using cytoembryological identification techniques taught by Applicant and then second increasing the stability for apomixis compared to the apomictic parent plant.

Bashaw, alone or in combination with Savidan or Dujardin fails to teach these steps in the unique combination as presently claimed. For example, the first step of Applicant's presently claimed method requires the producing of a facultatively apomictic plant by:

(i) selecting sexual plants from *Antennaria*, *Sorghum* or *Tripsacum*;

(ii) cytoembryologically identifying sexual plants from the selected plants having divergent reproductive schedules of ovule development such that initiation of embryo sac formation in one sexual plant occurs at about the same time as or before meiosis in the other sexual plant relative to the developmental maturity of the nongametophytic ovule and ovary tissues selected from the group consisting of: nucellus, integument, pericarp, hypanthium, and pistil wall; and

(iii) hybridizing the identified sexual plants having divergent reproductive schedules of ovule development;

(iv) recovering hybrid seed therefrom;

(v) sowing the hybrid seed; and

(vi) selecting a hybrid plant that is apomictic to be the apomictic parent plant.

As stated on page 8 of the Office Action, Bashaw fails to teach or suggest cytoembryological identification or chromosome doubling. More specifically, Bashaw fails to teach or suggest the step of cytoembryologically identifying and selecting sexual plants from *Antennaria*, *Sorghum* or *Tripsacum* having divergent reproductive schedules of ovule development such that initiation of embryo sac formation in one sexual plant occurs at about the same time as or before meiosis in the other sexual plant. Further, Bashaw fails to teach hybridization after cytoembryological identification of the specific plants (cytoembryologically identifying and hybridizing a first and second sexual plant wherein the initiation time of embryo sac formation in the first plant occurs at about the same time as or before meiosis in the second plant). This is at the heart of Applicant's invention. Bashaw also fails to teach chromosome doubling the selected hybrid plant produced in (i)-(vi). Without such teachings or suggestions, Bashaw cannot reasonably be found to make obvious the presently claimed invention, which specifically requires these limitations in the particular order recited in the claims.

Savidan fails to remedy the deficiencies of Bashaw. Savidan teaches cytoembryological techniques of differentiating between apomictic and sexual seed set of *P. maximum*, but does not teach, or for that matter even suggest, the presently claimed method of producing an apomictic

Antennaria, *Sorghum* or *Tripsacum* plant by (1) selecting sexual plants from *Antennaria*, *Sorghum* or *Tripsacum*; (2) cytoembryologically identifying sexual plants from the selected plants in order to identify a first sexual plant with the initiation of embryo sac formation occurring at about the same time as or before meiosis in a second sexual plant, followed by (3) hybridizing the identified first and second plants that were specifically identified having divergent ovule development schedules. As noted in the Office Action on page 8, Savidan does not teach cytoembryological identification of sexual plants having this specific divergent ovule schedule as presently claimed. The inventor surprisingly discovered and taught for the first time that by cytoembryologically identifying and hybridizing a first and second sexual plant having divergent reproductive schedules of ovule development such that the initiation time of embryo sac formation in the first plant occurs at about the same time as or before meiosis in the second plant an apomictic plant could be produced. Neither Bashaw or Savidan teach or suggest this alone or in combination.

Dujardin also fails to remedy the deficiencies of both Bashaw and Savidan. Dujardin teaches the generic doubling of chromosomes. There is no teaching or suggestion in Dujardin Bashaw, or Savidan, alone or in combination, that would motivate one skilled in the art to (1) select sexual plants from *Antennaria*, *Sorghum* or *Tripsacum*; (2) cytoembryologically identify sexual plants from the selected plants to identify a first sexual plant with the initiation of embryo sac formation occurring at about the same time as or before meiosis in a second sexual plant, followed by (3) hybridizing the identified first and second plants that were specifically identified wherein embryo sac formation occurs at the same time or before meiosis in the other plant. Therefore, Bashaw alone, or in view of Savidan, and further in view of Dujardin cannot make the presently claimed invention obvious as a matter of law. Applicant therefore respectfully requests that this rejection be withdrawn.

Title: "Methods for Stabilizing and Controlling Apomixis"

U.S. Serial No. 10/772,243

In view of the above amendments and arguments, Applicant now believes all claims to be in condition for allowance. If there are any questions, the Examiner is invited to call Applicant's representative Rodney Fuller at (602) 916-5404 to resolve any remaining issues to expedite the allowance of this application.

Respectfully submitted,

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